

Rock Point Arch Bridge  
Spanning Rogue River at Rock Point on Oregon Route 271  
Gold Hill  
Jackson County  
Oregon

HAER OR-29

HAER  
ORE,  
15-GOLHI,  
2-

PHOTOGRAPHS  
WRITTEN HISTORICAL AND DESCRIPTIVE DATA

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## HISTORIC AMERICAN ENGINEERING RECORD

### ROCK POINT ARCH BRIDGE (ROGUE RIVER BRIDGE AT ROCK POINT) HAER OR-29

**Location:** Spanning Rogue River and the Old Pacific Highway at Rock Point, on Sams Valley Highway (Oregon Route 271), about two miles west of Gold Hill, Jackson County, Oregon  
UTM: Gold Hill, Oregon Quad. 10/491675/4697575

**Date of Construction:** 1919-20 (North approach rebuilt 1953-54)

**Engineer:** Conde B. McCullough, Oregon State Highway Department

**Builder:** Parker & Banfield, Portland, Oregon

**Owner:** Oregon Department of Transportation

**Use:** Vehicular bridge

**Significance:** The Rock Point Arch Bridge was the first reinforced-concrete bridge that Conde B. McCullough designed for the Oregon State Highway Department after he became the State Bridge Engineer in the spring of 1919. Topography of the construction site prevented the use of traditional trestle-type falsework. Instead a Howe-truss bridge supported form work for the ribs of the main arch.

**Project Information:** Documentation of the Rock Point Arch Bridge is part of the Oregon Historic Bridge Recording Project, conducted during the summer of 1990 under the co-sponsorship of HABS/HAER and the Oregon Department of Transportation. Researched and written by Robert W. Hadlow, HAER Historian, 1990. Edited and transmitted by Lola Bennett, HAER Historian, 1992.

**Related Documentation:** For more information on Conde B. McCullough, see HAER OR-54.

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## HISTORY

William G. T'Vant, who settled in the Sams Valley in the 1850s, called the rolling hills of area around Rock Point the Dardanelles, for it reminded him of a region in Europe that had the same name. In 1859, pioneers established a post office near pointed rocky outcroppings on the Rogue river that flows through the valley. They named it "Rock Point" for the geological formations.<sup>1</sup>

A ferry crossed the Rogue River near Rock Point. It provided service from the 1850s until a simple bridge replaced it in the next decade. By the 1870s another early Oregonian, Thomas Chavner, built his "Centennial Bridge" a few miles up river from Rock Point. There, he platted the town of Gold Hill. In the early 1880s, the Oregon and California Railroad looked at both towns to find a permanent railway station in the region for its line. Rock Point citizens replaced their 1860s span, at this time, with a timber covered toll bridge, constructed of Howe trusses on cribbing piers. They hoped that this endeavor would show Oregon and California officials that their town was more worthy of consideration than was Gold Hill. Nevertheless, in 1882, the railroad company chose Chavner's townsite for their station. Eventually, both spans, Chavner's Centennial bridge and the Rock Point covered bridge, became free public crossings on the main stage route through the Sams Valley. This road became a portion of the Pacific Highway, later U.S. 99, in 1913.<sup>2</sup>

During the 1910s, members of the Oregon State Highway Commission and local residents concluded that the old covered bridge at Rock Point could no longer adequately serve an increasingly mobile public. Jackson County Commissioners asked if the state would cooperate in a project to replace the deteriorating structure. Conde B. McCullough, a professor of engineering at Oregon Agricultural College in Corvallis, became State Bridge Engineer in April 1919. He quickly went to work on designs for a reinforced-concrete ribbed deck arch for the Rock Point crossing over the Rogue River. On June 10, 1919, the OSHC approved a bid of \$46,930 by Parker and Banfield, a Portland contractor, to build the Rock Point Arch.<sup>3</sup>

## DESIGN AND DESCRIPTION

McCullough designed a 442-foot structure for the Rock Point crossing. Read north to south, it consisted of seven 25-foot reinforced-concrete deck girder spans, one 1'-8" reinforced-concrete slab pier, one 113-foot reinforced-concrete ribbed deck arch, one 1'-8" reinforced-concrete deck slab pier, and six 25-foot reinforced-concrete deck girder spans. Curb-to-curb it measured 19'. Railings consisted of 11-inch wide beveled banisters and 2'-2½" high urn-shaped balusters. The main arch spans a deep gorge, with streambed over 40 feet below the springline. Arch ribs measure 4' wide and 26" deep at the crown, and 79" deep at the skewbacks.<sup>4</sup>

Originally, McCullough planned to fasten the ribs into the deep chasm's walls through key openings in the solid rock. Yet, during excavation, crews found that fissures had made it uncertain that this type of anchorage was substantial enough to contain the horizontal thrust of the rib ends. McCullough decided to excavate beyond the original keys and grout in place two 2½-inch swedge bolts at the ends of each rib. These were 5' in length, and along with reinforcing bars of the ribs, hooked into 2½-inch transverse "anchor bars" at the skewbacks. McCullough determined the required size of these rods by calculating the bending strain that wet concrete would create upon the rib bars.<sup>5</sup>

The deep gorge of the Rogue river at Rock Point prevented McCullough from using the traditional trestle-type falsework in constructing the Rock Point Arch. Instead, he decided to support the forms for the concrete with a pair of Howe trusses spaced 16' on centers. Crews first

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constructed a raft and attached it to the banks of the stream with heavy wire cables. Then they assembled the trusses, anchored them to the rock walls, and dismantled the raft.<sup>6</sup>

Concreting of the ribs took place in early November 1919. McCullough worried that the truss bridge might settle under the load of the wet concrete, so he had all members of the wooden structure drawn up tight. The design allowed for a deflection of  $1\frac{3}{4}$ " under an entire load of wet concrete. Yet, in practice, the average drop was  $\frac{1}{2}$ " between the ribs.<sup>7</sup>

Workers continually battled with the great velocity of the Rogue River. Swift currents at Rock Point, where the channel narrows, combined with water levels that rose as much as 6 feet in a few hours and came within 3 inches of the bottom chords of the Howe trusses, made even the bravest carpenters and masons worry about their safety. Parker and Banfield finished the contract on February 17, 1920. Costs for the project totaled \$48,393.91. Of this, Jackson county paid \$23,000. The state assumed the balance.<sup>8</sup>

#### REPAIR AND MAINTENANCE

The Rock Point Arch required little more than routine maintenance throughout its first decade. Crews unplugged drains, pulled weeds, and cleaned the structure. By the early 1930s, though, the bridge's narrow roadway did not lend itself well to increasingly wider automobiles and trucks. A vehicle collided with a section of railing on the north approach in 1938. It knocked out thirteen balusters and folded the rail upon itself. Repeatedly, traffic damaged the structure, and at every instance the narrow curb-to-curb width was to blame.<sup>9</sup>

Jackson County's engineer, Paul B. Rynning expressed local residents' requests that the state widen the deck of the Rock Point Arch. State Highway Engineer, Robert H. Baldock claimed limited maintenance budgets prevented immediate action. Nevertheless, State Traffic Engineer, J. Al Head, reported that from 1941 through June 1948 there had been six accidents on the bridge, one head-on collision, two side swipes, and three "reported" collisions with the railings. Blind roadway approaches to the structure and excessive speed contributed to motor vehicle operators being unable to safely negotiate the bridge.<sup>10</sup>

The north viaduct approach to the Rock Point arch was in an extremely deteriorated condition by the early 1950s and traffic engineers believed that the north approach needed revision. The OSHC decided to replace it. In August 1953 the firm of Ausland and Dodson received a contract to construct a new north viaduct using a deck girder structure. Work began on October 6, 1953, and ended on May 17, 1954. It consists of one 45-foot, one 57-foot, one 50-foot, and two 37-foot reinforced-concrete deck girder spans. The approach met the 1920 span at the north pier and functioned as an overpass of U.S. Highway 99. Costs totaled \$50,706.50.<sup>11</sup>

Railings of the new north approach did not match those on the existing structure. Instead, the state chose to replace the existing, and repeatedly damaged, urn-shaped balusters and beveled railing with standard "GM" barrier-type rails. By 1977, much of the original balustrade on the south approach and main arch had deteriorated beyond repair. Damage caused by automobiles and trucks was just as responsible for it as was age. Maintenance engineers needed to decide whether state crews should replace these with standard concrete barriers or contract to widen the entire structure's 19-foot roadway. The Structural Design Section of ODOT's Highway Division determined that the state could widen the bridge's road deck, but it estimated the cost at \$420,000. The Department of Transportation's six-year plan for road improvements did not provide for new construction at Rock Point. At present the structure is much like it was in the 1970s. The Maintenance Section of ODOT has replaced many of the deteriorated or missing urn-shaped balusters on the south approach and main span with simple pre-cast square posts.<sup>12</sup>

ENDNOTES

1. Lewis A. McArthur, Oregon Geographic Names, fifth ed. revised by Lewis L. McArthur (Portland: Western Imprints, Oregon Historical Society Press, 1982), pp.207, 628-29.
2. ODOT, Highway Division, Environmental Section, "Engineering Antiquities Inventory," November 1982; "Fact Sheet Eight: Rock Point Bridge" (Jacksonville: Southern Oregon Historical Society, n.d.) p.1.
3. Oregon State Highway Commission, Fourth Biennial Report, 1919-20, p.30; Oregon Department of Transportation, Personnel Files, "McCullough, C.B."; ODOT, Highway Division, Bridge Section, Job Records, "Rock Point Bridge (No. 332A)"; "Two Interesting Concrete Bridges in Oregon," Engineering and Contracting, 26 October 1921, p.389.
4. See ODOT, Highway Division, Bridge Section, "Bridge Plans," Rogue River Bridge at Rock Point (No. 332A), Drawings No. 835 and 838; C.B. McCullough, "Arch Bridge With Ribs Anchored by Concrete Keys," Engineering News-Record 83 (27 November-4 December 1919) p.924.
5. McCullough, "Arch Bridge With Ribs Anchored by Concrete Keys," p.924; C.B. McCullough, "Truss Centering Used for 113-Ft. Concrete Arch," Engineering News-Record 84 (29 April 1920) pp.851-52.
6. Engineering and Contracting, p.391; R.P. Clark, Letter to Parker and Banfield, 28 July 1919, "Rock Point Bridge," Microfilmed Records, Bridge Section, Highway Division, ODOT.
7. McCullough, "Truss Centering Used ..."; Engineering and Contracting, p.391.
8. Engineering and Contracting, p.391; OHSC, Fourth Biennial Report, p.265.
9. ODOT, Bridge Section Maintenance Files, "Rock Point Bridge (No. 332A): Bridge Maintenance, Repair and Renewal, 1922-1931"; "Bridge Inspection, Maintenance, and Repair," 17 January 1935.
10. Paul B. Rynning, Jackson County Engineer, Letter to R.H. Baldock, 10 August 1948, "Rock Point Bridge (No. 332A)," ODOT, Bridge Section Files (microfilm); Baldock, Letter to Rynning, 18 August 1948; J. Al Head, State Traffic Engineer, Letter to G.S. Paxson, State Bridge Engineer, 24 August 1948.
11. ODOT, Engineering Antiquities Inventory, "Rock Point Arch"; ODOT, Job Records, "Rock Point Arch (No. 332A)".
12. J.X. Wilson, Regional Maintenance Engineer, Letter to George T. Thornton, District Engineer, 6 April 1977, "Rock Point Arch (No. 332A)," ODOT, Bridge Maintenance Files; F.B. Klaboe, Assistant Director for Operation, ODOT, Letter to Delos Walker, Gold Hill Chamber of Commerce, 3 March 1978.

ADDENDUM TO  
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